

CLAIMS

1. An information recording medium comprising: a pair of electrodes; and a liquid crystal material filled into a gap between said electrodes, said liquid crystal material having a property such that charge-transport properties are varied according to a phase transfer between a plurality of stable liquid crystal phases of the liquid crystal and/or a history of the phase transfer.
2. The information recording medium according to claim 1, wherein the phase transfer of the liquid crystal material occurs upon a change in temperature of the liquid crystal material.
3. The information recording medium according to claim 1, wherein the information is recorded by applying thermal energy.
4. The information recording medium according to claim 1, wherein the information is read by measuring the value of a photoelectric current generated by light applied to an information recorded portion.
5. The information recording medium according to claim 1, wherein at least one of the pair of electrodes is transparent to light.
6. The information recording medium according to claim 1, wherein the thickness of the gap between the electrodes is larger than the size of a domain at least in the initial state of the liquid crystal material.
7. The information recording medium according to claim 1, wherein a thermal head or a laser beam is used as means for applying thermal energy for information recording.
8. The information recording medium according to claim 1, wherein the liquid crystal material comprises a liquid crystalline charge-transport material, a background for information recording is in a

state such that the charge-transport properties are inhibited attributable to polycrystalline structural defects in the initial state of the liquid crystal charge-transport material, and

information recording is carried out by phase transfer caused in the background upon the application of thermal energy.

9. The information recording medium according to claim 1, wherein two or more charge-transport properties can be developed in a specific liquid crystal phase according to the level of the thermal energy applied.

10. The information recording medium according to claim 1, wherein the pair of electrodes are provided on a substrate.

11. The information recording medium according to claim 1, wherein the thickness between the pair of electrodes satisfies both requirements represented by inequalities (A) and (B):

(Permeation depth at excitation light wavelength of liquid crystal material) < (Thickness between pair of electrodes) (A)

(Thickness between pair of electrodes) < (Thickness which can exhibit field strength such as to enable reading of photoelectric current) (B).

12. The information recording medium according to claim 1, wherein the domain size of the liquid crystal material is smaller than the thickness of the gap between the electrodes.

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A1

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